



# NIF Programs

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# focus

## NIF Programs

News about the  
NIF Programs Directorate  
at Lawrence Livermore  
National Laboratory

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### 1st FAU Bus Installed, More Being Produced

Workers installed the first FAU amplifier bus containing the main amplifier into the National Ignition Facility (NIF).

"We are producing frame assembly unit enclosure buses successfully," says Buzz Pedrotti, lead engineer of the NIF Amplifier team. "We've received the first 600 of the 7,500 flashlamps we'll need. We are well on our way to building NIF's amplifiers successfully."

Frame assembly unit (FAU) enclosures hold the flashlamp cassettes and laser glass slab cassettes in position in the laser beam path.

By the end of June, six of the 24 FAU enclosures required will have been produced. These precision mechanical structures, or buses as they are nicknamed (because their size and shape resemble the large vehicles), are large metal frames that house the components of the main and power amplifiers.

FAU buses serve an important purpose in the NIF facility. They allow the line-replaceable units (LRUs) to be replaced between

shots without disrupting adjacent components, which allows the laser to operate two or more shots per day. Regular maintenance activities, such as replacing flashlamps or laser glass, occur between shots.

"We have achieved all of the goals for this complex part of the amplifier that we set five years ago," says Buzz Pedrotti, lead engineer of the NIF Amplifier team.

The FAU enclosure team, led by Responsible Engineer Ernie Moor and Technician Supervisor Chuck Petty, met their requirements, including higher cleanliness levels than ever before for large components, and precise

positioning of the laser slabs.

The enclosures are currently being assembled in the clean amplifier assembly facility under the direction of production manager Tom Kohut. The two-shift operation, led by Shift Leaders Jim Nally and Randy Aceves, are regularly achieving ambitious production goals.

The FAU components are now undergoing life-time tests along with power conditioning components developed by the NIF Power Conditioning team, led by Mark Newton.

The enclosures hold flashlamp cassettes on the outside and space between

(see Amplifier, page 4)

John Trent, Don Davis, Jay Pimenttel, and Ron Bergen, NIF mechanical engineers, and ironworkers from Jacobs Facilities Inc. install the first amplifier bus into the NIF facility.

—photo by Jacqueline McBride



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of X-division, states, "Having Ian here for the summer will allow us to make progress on a problem that has been on my to-do list and give him an introduction to LLNL and the type of science that is done here."

Felicia Costello is a Materials Science and Engineering major from Case Western Reserve University who will have the opportunity to help grow six-inch crystals in small growth tanks. Felicia will assist scientist Terry Land from Chemistry in the R&D effort to test the effects of varying growth parameters on damage threshold and homogeneity. With Terry's help, Felicia will explore the effects of temperature, filtration and doping with various impurities on crystal performance.

Terry notes, "It's nice to have bright, energetic students to interact with the group. The interns are very enthusiastic and curious. Explaining the science of what we do is a reminder to us how interesting our jobs really are. They are often able to accomplish quite a bit of work during their stay."

Many NIF Program student interns are undergraduates from universities outside of the Bay Area, including Massachusetts Institute of Technology, the Case Western Reserve University and Northern Arizona University. Most participants study physics, chemistry, materials science, engineering or computer science.

In addition to working on their research projects, summer interns will attend lectures, participate in social activities, and have the opportunity to tour the NIF facility. Each student will present project results at the end of the summer.

Read more about hosting or sponsoring summer interns at <http://www.llnl.gov/jobs>.

—Kim Herrmann

## focus on Awards

The NIF Programs' Document Services staff was commended on June 13, 2001 by the Technical Information Department. In last year's Society for Technical Communication competitions, Document Services earned two awards from the Northern California Chapter and five from the Phoenix Chapter. The Society, an international organization, presents the following four levels of award, in ascending order of rarity: Achievement, Merit, Excellence, and Distinguished. Congratulations Document Services!

### Northern California Chapter Competition (documents)

*ICF Quarterly Report Vol. 9 No. 2, Excellence:*

Jeff Atherton, Treva Carey, Jason Carpenter, Cindy Cassady, Pamela Davis, Steve Greenberg, Paul Harding, Roy Johnson, Robert Kirvel, Sandy Lynn, Frank Marquez, Al Miguel, Toney Sanchez, Frank Uhlig.

*ICF Quarterly Report Vol. 9 No. 3, Merit:*

Jason Carpenter, Jeff Colvin, Pamela Davis, Kim Herrmann, Roy Johnson, Sandy Lynn, Brian MacGowan, Kathy McCullough, Al Miguel.

### Phoenix Chapter Competition (artwork)

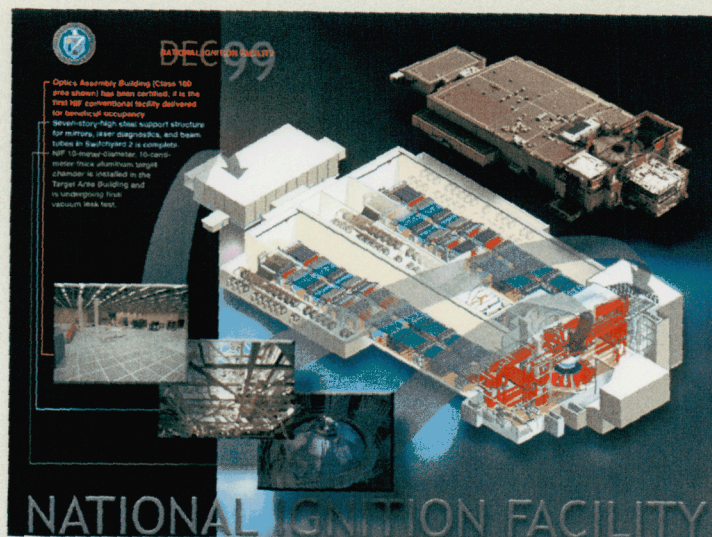
*December 1999 NIF Status (poster, below), Distinguished:*  
Tom Reason.

*Rendezvous with Science (poster), Excellence:*  
Kathy McCullough.

*NIF Hohlräum Target (photo), Merit:*  
Jacqueline McBride, Bryan Quintard.

*Inside the NIF Target Chamber (photo), Merit:*  
Jacqueline McBride, Bryan Quintard.

*The National Ignition Facility, Its Mission, and How it Works (poster), Merit:*  
Clayton Dahlen, Jason Carpenter.





# update

## Web

New Summer Web releases:

### Administration

<http://www-r.llnl.gov/nif/admin/index.html>

### WAN

<http://www-r.llnl.gov/nif/wan>

### NIF Project Internal

#### ES&H

<http://www-r.llnl.gov/nif/nifproj/esh/index.html>



—Shannon Hornstein

## Amplifier (continued from page 1)

two columns of glass slabs. Reflectors near each flashlamp are silver-coated and specially shaped to direct the light to the optimal location on the glass slab.

Between the flashlamps and the glass slabs are high-transmission windows that protect the glass slabs from dirt, while allowing light to pass through. These windows, developed over a three-year period with technical contributions by many scientists and engineers led by Bob Boyle Jr., now meet their challenging requirements in a very tight space. The design team, as well as the Optics Processing Development team that assembles the 1800 windows under the guidance of Production Manager Jim Fair, made this difficult task a success.

"The NIF amplifier combines the best concepts of previous LLNL amplifiers with many innovations that have been developed by scientists in the Laser Science and Technology Program over the past 20 years, since Nova was first deployed," says Pedrotti. "The NIF amplifier bottom-loading FAUs are a design innovation that reduces contamination and improves maintenance

while occupying a very compact space. The concept pushes the laser technology state-of-the-art in size and complexity."

Another innovation is a specially coated silver surface for reflectors that will not tarnish, preserving high reflectivity for the lifetime of NIF, directing as much of the flashlamp light as possible onto the laser slabs.

A special challenge is the high cleanliness requirements of the amplifier FAUs, according to Pedrotti, requiring very clean working environments, body suits for workers, specialized handling fixtures and extensive testing.

"The LRU assembly team under the leadership of Responsible Engineer John Horvath and Lead Technical Associate Rick McCracken is now conducting tests to verify that the special handling equipment to cleanly assemble and install the slab and flashlamp cassettes can meet NIF requirements," he says.

Currently, the Project is storing completed buses until the facility is ready for their installation. The remaining 11 buses will be installed over the next 15 months. The first flashlamp cassettes will be installed next spring, and the first laser glass slabs will follow in the summer. Laser commissioning operations will then commence.

—Cindy Cassady

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